CLAIMS

We claim:

1. A low temperature autoignition composition for safely initiating combustion of a main pyrotechnic charge in a gas generator or pyrotechnic device exposed to flame or a high temperature environment, consisting essentially of:

a mixture of an oxidizer composition and a powdered metal fuel, wherein the oxidizer composition comprises silver nitrate or a comelt or mixture comprising silver nitrate and at least one of an alkali metal nitrate, an alkaline earth metal nitrate, a complex salt nitrate, a dried, hydrated nitrate, an alkali metal chlorate, an alkali metal perchlorate, an alkaline earth metal chlorate, an alkaline earth metal perchlorate, ammonium perchlorate, sodium nitrite, potassium nitrite, silver nitrite, a complex salt nitrite, a solid organic nitrate, a solid organic nitrite, or a solid organic amine, wherein the metal fuel and oxidizer are present in amounts sufficient to provide an autoignition composition having an autoignition temperature of no more than about 232°C.

2. The low temperature autoignition composition of claim 1, wherein the oxidizer is a comelt comprising silver nitrate and at least one of an alkali metal nitrate, alkali metal nitrite, alkali metal chlorate, alkali metal perchlorate, alkaline metal nitrate, alkaline metal nitrite, alkaline metal chlorate, alkaline metal perchlorate, sodium nitrite, potassium nitrite, or silver nitrite.

3. The low temperature autoignition composition of claim 2, wherein the powdered metal fuel is selected from the group consisting of molybdenum, magnesium, calcium, strontium, barium, titanium, zirconium, vanadium, niobium, tantalum, chromium, tungsten, manganese, iron, cobalt,

nickel, copper, zinc, cadmium, tin, antimony, bismuth, aluminum, cerium, and silicon.

4. The low temperature autoignition composition of claim 3, wherein the powdered metal fuel is selected from the group consisting of molybdenum, magnesium, titanium, zirconium, niobium, nickel, chromium, zinc, aluminum, and cerium.

5. The low temperature autoignition composition of claim 4, wherein the powdered metal fuel is selected from the group consisting of molybdenum, magnesium, titanium, zirconium, zinc, and cerium.

6. The low temperature autoignition composition of claim 5, wherein the powdered metal fuel is molybdenum.

7. The low temperature autoignition composition of claim 5, wherein the oxidizer is selected from the group consisting of silver nitrate and comelts comprising silver nitrate and potassium nitrate, silver nitrate and sodium nitrate, and silver nitrate and lithium nitrate.

8. The low temperature autoignition composition of claim 5, wherein the oxidizer is a comelt comprising silver nitrate and potassium nitrate.

9. The low temperature autoignition composition of claim 7, wherein the powdered metal fuel is molybdenum.

10. The low temperature autoignition composition of claim 9, wherein the comelt is ground to a particle size of about 10 to about 30 microns, and the molybdenum powder has a particle size of less than about 6 microns.

11. The low temperature autoignition composition of claim 7, wherein

the mole fraction of silver nitrate in the comelt is about 0.4 to about 0.6;

the mole fraction of potassium nitrate in the comelt is about 0.6 to 0.4; and

the comelt is mixed with at least a stoichiometric amount of molybdenum powder fuel.

12. The low temperature autoignition composition of claim 11, wherein the autoignition temperature is about 130-135°C.

13. The low temperature autoignition composition of claim 1, wherein the oxidizer comprises a mixture of silver nitrate and a solid organic nitrate, solid organic nitrite, or solid organic amine.

14. The low temperature autoignition composition of claim 13, wherein the oxidizer comprises a mixture of silver nitrate and guanidine nitrate.

15. The low temperature autoignition composition of claim 13, wherein the powdered metal fuel is selected from the group consisting of molybdenum, magnesium, titanium, zirconium, niobium, nickel, chromium, zinc, aluminum, and cerium.

16. The low temperature autoignition composition of claim 13, wherein the powdered metal fuel is selected fuel from the group consisting of molybdenum, magnesium, titanium, zirconium, zinc, and cerium.

17. The low temperature autoignition composition of claim 13, wherein the powdered metal fuel is molybdenum.

18. The low temperature autoignition composition of claim 17, wherein the amount of molybdenum fuel is great r than th stoichiometric amount, thereby providing an autoignition composition having an autoignition temperature that is less than the autoignition temperature of a similar composition having a stoichiometric amount of molybdenum fuel.

19. The low temperature autoignition composition of claim 1, further consisting essentially of an alkali metal chloride, alkali metal fluoride, alkali metal bromide, alkaline earth metal chloride, alkaline earth metal fluoride, or alkaline earth metal bromide, comelted with a nitrate, nitrite, chlorate, or perchlorate.

20. The low temperature autoignition composition of claim 1, further consisting essentially of an output augmenting composition, which comprises a metal in combination with an energetic oxidizer selected from the group consisting of ammonium perchlorate, alkali metal chlorates, alkali metal perchlorates, and alkali metal nitrates.

21. The low temperature autoignition composition of claim 1, wherein the oxidizer comprises silver nitrate and a complex salt nitrate of $Ce(NH_4)_2(NO_3)_6$ or $ZrO(NO_3)_2$.

22. The low temperature autoignition composition of claim 1, wherein the oxidizer comprises silver nitrate and a dried, hydrated metal nitrate of $Ca(NO_3)_2 \cdot 4H_2O$ or $Cu(NO_3)_2 \cdot 2.5 H_2O$.

23. The low temperature autoignition composition of claim 1, further consisting essentially of a metal oxide catalyst.

24. The low temperature autoignition composition of claim 23, wherein the metal oxide catalyst is selected from the group consisting of Al_2O_3, SiO_2, CeO_2, V_2O_5, CrO_3, Cr_2O_3, MnO_2, Fe_2O_3, Co_3O_4, NiO, CuO, ZnO, ZrO_2, Nb_2O_5, MoO_3, and Ag_2O.

add A4 & B5